

Amendments to Claims

1. (Currently Amended) A device for absorption of impact energy when fixed in use to a vehicle body component, said device comprising one or more deformable members of shape memory material aligned for deformation by an impact on said device, each of said one or more deformable members having a first strength level at an operating temperature of the device and a second strength level at a higher temperature, and each of said one or more deformable members being selectively heatable, before said impact or at the onset of said impact, from said operating temperature to said higher temperature to tune the energy absorption capacity of the device without changing the shape of said one or more deformable members.

2. (Currently Amended) The device recited in claim 1 in which said one or more deformable member ~~or members~~ are aligned between a vehicle bumper and a vehicle body rail.

3. (Currently Amended) The device recited in claim 1 comprising:
a crash box having an inlet end;
a ram having a first end partially inserted into the inlet end of the box and a second end, the ram being aligned when fixed in use to receive an impact on said vehicle body at the second end and to be driven by said impact further into said crash box; and
each of said one or more ~~of said deformable members, said deformable member(s)~~ having two ends with one end being fixed to said box and the other end fixed to said ram for absorption of impact energy by stretching of ~~the~~ said one or more deformable members.

4. (Currently Amended) The device recited in claim 1 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory metal alloy.

5. (Currently Amended) The device recited in claim 1 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory metal alloy comprising titanium and nickel, and said at least one deformable member has a relatively low strength martensite phase at said operating temperature and a higher strength austenite phase at said higher temperature.

6. (Currently Amended) The device as recited in claim 3 in which at least one of said one or more deformable members ~~a said deformable member~~ comprises a spring.

7.- 10 (Canceled)

11. (Currently Amended) A device for absorption of impact energy when fixed in use to a vehicle body component, said device comprising one or more deformable members of a shape memory material aligned for deformation by an impact on said device, said one or more deformable members being deformable from an initial shape ~~under an impact of predetermined magnitude~~ and thereafter restorable to their initial shape upon being heated to a predetermined temperature;

said one or more deformable members having a first strength level at an operating temperature of said device and a second strength level at a temperature above the operating temperature; and

an electrical connection to each of ~~the~~ said one or more deformable members for selectively and individually heating said one or more ~~individual~~ deformable members, before said impact or at the onset of said impact, by electric resistance heating to tune the energy absorption capacity of the device without changing the shape of said one or more deformable members.

12. (Currently Amended) The device for absorption of impact energy as recited in claim 11 in which said one or more deformable members are of a shape memory metal alloy having a first strength level at an operating temperature of said device and a second and greater strength level at a temperature above the operating temperature; such that individual deformable members of said one or more deformable members can be selectively heated to increase the energy absorption capacity of the device.

13. (Previously Presented) The device for absorption of impact energy as recited in claim 12 in which said one or more deformable members comprise titanium and nickel.

14. (Currently Amended) A device for absorption of impact energy when fixed in use to a vehicle body component, said device comprising:

a crash box having an inlet end;

a ram having a first end partially inserted into the inlet end of the crash box and a second end, the ram being aligned when fixed in use to receive an impact on said vehicle body at the second end and to be driven by said impact further into said crash box;

one or more deformable members of shape memory material, said one or more deformable members being deformable from an initial shape ~~under an impact of predetermined magnitude~~ and thereafter restorable to their initial shape upon being heated to a predetermined temperature, said one or more deformable member(s) having two ends with one end being fixed to said box and the other end fixed to said ram for absorption of impact energy;

said one or more deformable members having a first strength level at an operating temperature of said device and a second strength level at a temperature above the operating temperature; and

an electrical connection to each of ~~the~~ said one or more deformable members for selectively and individually heating said one or more ~~individual~~ deformable members by electrical resistance heating to tune the energy absorption capacity of the device.

15. (Currently Amended) The device recited in claim 14 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory metal alloy having a first strength level at an operating temperature of said device and a second and greater strength level at a temperature above the operating temperature; such that said at least one deformable member can be selectively heated to increase the energy absorption capacity of the device.

16. (Currently Amended) The device recited in claim 14 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory metal alloy comprising titanium and nickel.

17. (Currently Amended) The device recited in claim 1 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory polymer or a combination of a shape memory alloy and shape memory polymer.

18. (Currently Amended) The device recited in claim 14 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory polymer or a combination of a shape memory alloy and shape memory polymer.

19. (Currently Amended) The device recited in claim 1 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory polymer having ~~, and each said deformable member has~~ a relatively high strength at said operating temperature and a lower strength at said higher temperature.

20. (Currently Amended) The device recited in claim 14 in which at least one of said one or more deformable members ~~a said deformable member~~ is a shape memory polymer having ~~, and each said deformable member has~~ a relatively high strength at said operating temperature and a lower strength at said higher temperature.